AVIATION

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JUNE 22, 1925 Issued Weekly PRICE 10 CENTS

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VOLUME XVIII

NUMBER 25

SPECIAL FEATURES

HOW TO BUILD A GLIDER

AIRCRAFT AND THE HAWAIIAN MANEUVERS

GUGGENHEIM ENDOWS N.Y.U. AERO COURSE

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
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Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

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"BEST IN THE LONG RUN"

JUNE 22, 1925

AVIATION

VOL. XVIII. NO. 25

Published every Monday

CONTENTS

Editorials	689	Who's Who in American Aeronauties	694
Aircraft and the Hawaiian Maneuvers	690	Light Planes and Gliders	696
The Naval Air Battle of the Future	691	German Gliding Competition	697
N.Y.U. Aero Course Endowed	692	Airports and Airways	698
Curtiss Building New Commercial Ship	693	United States Air Forces	700
Insurance Survey	694		

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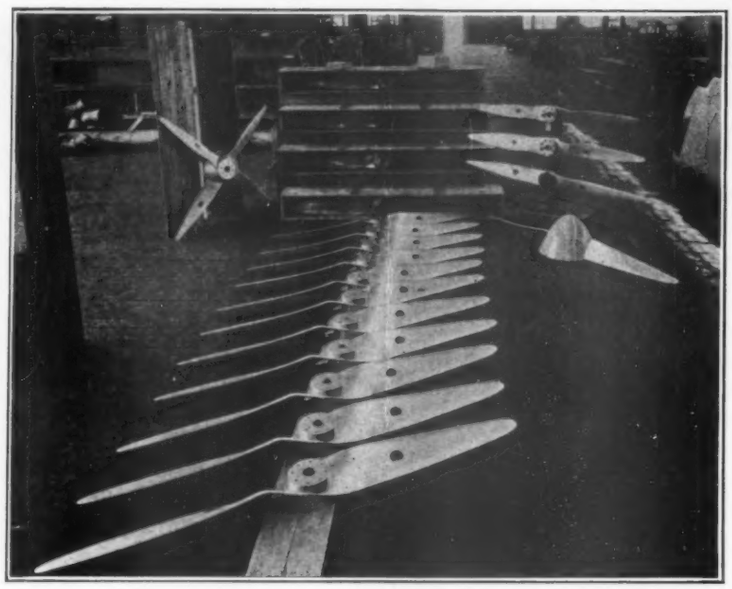

In this age of rapid scientific development, the line between luxuries and necessities is so finely drawn, that anything which tends towards progress and advancement is soon adopted as necessary, even sooner than the old adage would have it.

In the humble field of aeroplane propeller construction, the above holds true, and the metal propeller in the remarkably short period of four years has become a real necessity. Certainly no manufacturer can afford to turn out any commercial machines without careful consideration of this wonderful new invention, and even commercial operators should give it serious thought because of added safety, durability, increased performance and pay load.

Mr. Leslie L. Irving of the Irving Airchute Company, Buffalo, N. Y., writes:

"Having flown my Swallow for about twenty-five hours with a new Curtiss-Reed metal propeller, I would like to say that I am entirely pleased with the results. I believe that it has increased the climb at least 20% and greatly helped on the take-off."

Mr. W. A. Yackey, of the Yackey Aircraft Company, Chicago, advises:

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Guggenheim School of Aeronautics

MR. DANIEL GUGGENHEIM's gift of $500,000 with which New York University will found a school of Aeronautics reveals a vision of the future and a generosity of purpose which is an inspiration to all those connected with aviation. The gift came almost without solicitation. Mr. Guggenheim's son was an aviator during the war and is still actively interested. He was on the committee which was trying to raise an endowment for the chair of aeronautics and consulted his father as to the methods of doing it. As soon as Mr. Guggenheim senior heard of the project he realized its significance and after a thorough study of the plans he decided to give the whole amount needed himself. Mr. Guggenheim's business success testifies to his ability and foresightedness; his vision of the future of the air and his immediate realization of the fostering influence of proper technical training should bring new courage to us all.

The trial and error method of many of the early pioneers is gradually being replaced by truly scientific methods. We are accumulating a wealth of fact about aerodynamics and the use of aircraft. If we are to keep pace with the other nations this knowledge must be imparted to the younger generation and this is one of the main purposes of the new School of Aeronautics. Europe long ago recognized this and especially in Germany there are a large number of engineering schools which give courses in aeronautics. The equipment with which the new school will be supplied should make it a center for those who wish to conduct original research work. Mr. Guggenheim could not have made a more constructive gift, it is hoped that others will follow his example.

Increased Interest in Technical Aeronautics

AERONAUTICS is thought by many to be confined to a group of enthusiasts. These enthusiasts have frequently been regarded by their friends and associates as wasting their time. The outstanding achievements of the Air Mail Service and the formation of the National Air Transport, Inc., have convinced some of the doubters that they are failing to keep abreast of the times All professions are now coming to see that they will have some connection with or interest in commercial air transportation. Various technical societies are holding aeronautical meetings. The time has come when other industries feel that they should have accurate information. The two latest recruits are the New York Electrical Society and The Traffic Club of New York.

Aeronautical engineering has the same basis as all other kinds of engineering. Practically all the materials used in the construction of aircraft are used in other industries. Many of the accessories and instruments for aircraft are manufactured, at the present time, as a side line by firms who supply the older branches of engineering. Technical men depend very largely on their professional societies for information on new developments. The larger the number of meetings of these societies that are devoted to aeronautics, the greater the cooperation with and consequent benefit to commercial air transportation.

Feeder Lines

ALMOST everbody interested in aviation has at one time or another planned or been connected with the planning of an air transport line. For various reasons, none of the airlines thus far operated have worked out successfully, but throughout the country there are still thousands of men who hope some day to be at the head of an aerial transportation line. The actual formation of National Air Transport, Inc., and of the Ford Air Line will stimulate this hope, but to the men who have worked in aviation for years and have tried to start airlines themselves, the announcement that these powerful companies have entered the field will come almost as a frustration of their own personal ambitions. It will be almost impossible for men who have tried to start airlines of their own, and failed, not to take a dog in the manger attitude toward those who have been successful.

This mental attitude will not advance the cause of commercial aviation, and in the long run it will not help the men who hold it. It must be realized that the inevitable has happened. Air transportation along the main arteries of traffic could never have been started by companies inadequately financed and with antiquated equipment.

The United States covers a large area and it is inevitable that the most obvious routes will be controlled by great corporations. But there will always remain plenty of routes where smaller companies can operate with good chances of success.

Heretofore air mail runs of two or three hundred miles have not been patronized, as there was not enough saving over the train time. With the establishment of the night Air Mail Service this condition changes. There are many towns within a few hundred miles of the New York-San Francisco air line whose normal mail trains cannot connect with the night Air Mail and that will be forced to establish air connections for their mail or else lose a business day in sending and receiving mail from the larger cities. The rates of postage for these short feeder lines will have to be worked out on a different basis from the long haul routes. There is a provision in the Kelly bill for carriers of air mail to receive four-fifths of the ordinary first class postage rate. Obviously four-fifths of all the revenue from first class mail on a two hundred and fifty mile run is a greater incentive than the special air postage franchise on a thousand mile run. The air transport companies which handle the trunk air lines will welcome the business developed by feeder lines and the experience and pioneer work of the large companies, which have the capital to experiment with, will work to the ultimate profit of the smaller companies.

Aircraft and the Hawaiian Maneuvers

Results Showed the Importance of Aircraft and the Availability of Aircraft Brought near the Scene of Action in Crates

Maj. Gen. John L. Hines, Chief of Staff, and one of the chief umpires at the Hawaiian Grand Joint Exercise, authorized the following statement:

The Grand Joint Exercise just concluded in Hawaii was the biggest and most interesting one ever held by our Army and Navy. It had two principal objects:

1. To test the project and plans for the defense of Oahu; and

2. To train the Army and Navy in joint operations.

The problem for the exercise was drawn up by the Joint Board and was extremely simple in form, although its solution was difficult for both sides. The following facts were assumed:

1. That a state of war existed between Blue (the United States), and Black;

2. That the Hawaiian Islands were a Black possession and were defended by the existing armament, the present naval district forces and a garrison of approximately 14,000 men; and

3. That Blue was desirous of capturing Oahu with the object of making use of it as a Naval Base.

Black's Problem

The Blue Fleet, accompanied by an expeditionary force of two divisions of troops, was concentrated in San Francisco and put to sea April 15. Under the terms of the problem, the transports accompanying the Fleet were not to be farther than 1,700 mi. from San Francisco at 5.00 a. m., April 25, 1925, the hour and date when the problem actually opened. The Black or Hawaiian side was restricted to the use of forces and means actually available, whereas the Blue Fleet had two constructive divisions of troops, represented by some 1,500 Marines.

Black knew of the impending attack in ample time and estimated that Blue would seize a base on Lanai, one of the islands of the group, preparatory to launching an attack against Oahu itself. Black was in a difficult situation. No reinforcements could be expected and neither air forces, sub-surface nor fast surface vessels were available in sufficient strength to permit Black to deny any of the outlying islands to Blue. The arrangements made for defense were, in general, admirable and were efficiently carried out, the conduct of practically all forces engaged being exemplary. Everyone was on the qui vive. Possible landing places were held by a thin beach cordon, plentifully supplied with field guns, machine guns, etc., and backed by strong points and small mobile reserves. The Black air forces, both Army and Navy, were concentrated on Oahu, seven DH4B's being, however, despatched to the island of Lanai. The surface and sub-surface vessels and aircraft of the Naval District formed an observation cordon around Oahu at a sufficient distance to give timely warning of the enemy's approach.

Blue's Problem

Blue's task was also difficult in that it involved an attack against a strongly fortified island some two thousand miles from Blue's nearest home base. In the very nature of the case, such an attack was a major operation and therefore required extensive and careful preparations. Since a direct attack against Oahu was too hazardous, Blue planned to seize one of the outlying islands, Molokai, and to establish an air base there and to follow this with a naval demonstration against a bay on the south coast of Oahu for the purpose of diverting Black's attention. Blue then proposed to direct his main landing attack against the North coast of Oahu, while simultaneously therewith making a secondary landing on the West coast of Oahu.

Blue made his dispositions accordingly. Blue was successful not only in seizing Molokai, but Lanai as well and in occupying the landing fields on both islands early on the twenty-fifth. *This success may be ascribed in large measure to the fact that instead of moving the airplane carrier Langley close inshore and exposing her to attack by Black submarines, Blue kept her well offshore and had her fly her planes off to the landing fields on Molokai and Lanai as soon as these had been seized by the Advance Force. The seven Black airplanes despatched to Lanai gave a good account of themselves, sinking a Blue tender and inflicting serious damage on the Blue landing forces. They were far too weak to prevent the seizure of the two islands.*

Blue had been successful in seizing a base in dangerous proximity to Oahu. *With local command of the sea and with a superior air force in his hands, Blue was reasonably sure of ultimate victory. But Black aircraft and submarines did all in their power to make winning as hard and costly as possible to Blue.*

The aircraft with the Expeditionary Force were to furnish illumination (flares) for beach bombardment and smoke screens to cover first landings to reconnoiter hostile gun positions and troop movements; to spot for covering and supporting gun fire.

These landing operations demonstrate another lesson. The defense against them must be flexible and mobile. *Dependence must not be placed primarily or even predominantly upon mechanical means—field guns and machine guns—but upon mobile troops and aircraft,* counter-attacking whenever and wherever necessary. A commander must not only have troops enough to hold the essential positions and to man his armament, but he must have enough troops left to form an adequate reserve. In this instance, the commander could not do this, for his force was not adequate for the task assigned to it. He did all he could with the forces given him; he could not do the impossible.

Conclusion

Analyzing the results of the exercises from the standpoint of their objects, it is believed—

1. That the project and plans for the defenses of Oahu have been tested and that the deficiencies therein have been disclosed.

2. That very valuable training has been given the Army and the Navy in joint operation.

The naval accounts are now coming through from returning observers. Inasmuch as there was published in an Hawaiian newspaper, probably through an indiscretion, the complete problem involved together with the purposes of the maneuver it would seem to be very proper if the people of this country were given more details as to the whole proceedings.

First, it may be stated that both Army and Navy officers are showing a profound respect for aircraft, a very wholesome sign. While the umpiring of air work both at Panama and Hawaii was so conducted that opportunities were lost for reattack where missions that were declared a failure were considered by the attacking air forces as successful. In future maneuvers this difficulty should be remedied. As has been indicated, the experience at Hawaii has made aircraft a prime factor in the consideration of future defenses or attacks.

It is reported that the Navy officers made excellent use of their air fighters. Although there has been much effort to belittle aircraft previously, it is now realized that the first stage of any naval engagement where an enemy has aircraft must be to gain supremacy in the air. *Quite evidently that was their intention when they took the time to establish a base on one of the islands within striking distance of Oahu, but out of reach of coast defenses.* Airplanes which had been brought on *freighters and large ships in crates were set up by the aviation experts on the aircraft carrier Langley,* and

within a very short time the attacking force had an air fleet larger than that of Oahu's defenders. *It was easy enough to cover the Marine Corps' landing force when the fleet had supremacy in the air—without that supremacy the ships containing the landing party might have been blown to bits. The chiefs in command of the Navy force admitted in the critique held after the war game that they took the time to capture and make use of the island base near Oahu only because they knew they probably could not capture the island without air supremacy.*

Another great lesson which the maneuvers taught is that a large number of aircraft carriers may not be necessary to attack a poorly equipped nation. It has been thought that the United States was safe against airplane attacks because no country had enough aircraft carriers to bring a large number of planes across the Atlantic or Pacific ocean. The maneuvers showed that this was not necessary. *Neither is it necessary to fly the planes across these oceans.* If England should wish to make war on the United States she could send thousands of airplanes, crated, in fast merchant ships, including large-space passenger liners like the Olympic and Majestic, toss them ashore at Halifax or some point even nearer the United States, put them in flying condition with the equipment and trained personnel carried in her aircraft carriers, and make the air attack on New England and New York from a base within 300 or 500 mi. In the same way the islands of the West Indies could be used. Or some nation could establish a base in Lower California, with or without Mexico's consent, or near Vancouver, B. C., with or without England's consent, and attack us by air from those points. This method of transporting airplanes was very successfully used during the Hawaiian maneuvers and proved that *aircraft carriers need only be necessary subsidiaries.* The attacking fleet might not have been able to capture Oahu if only the airplanes launchable from the catapults and the deck of the Langley had been used; but with the addition of those sent into the air from the land base Oahu was easily conquered.

The Naval Air Battle of the Future

Editor, AVIATION:—

Will you permit me a few brief comments on "The Naval Air Battle of the Future," by M. H. McIntyre.

Scouting planes with a large radius of action should not rely on a sluggish compass needle alone, but should have radio receiving apparatus and get their direction at frequent intervals by radio from the mother ship, to which they expect to return when the flight is completed. There will be naval engagements in which the commander-in-chief himself commands the battle from on high, directing the exact maneuvers of his fleet, as the chess player moves his pieces over the board, all of which is in plain sight.

It is an error to say that the enemy surface ships know as well as the aviator the one point from which bombs can be successfully launched, for the surface ship does not know and cannot know accurately the height from which the bomb will be discharged or at which the airplane is flying at any given time. In a word, the altimeter gives a much more accurate knowledge of height than any known method yet discovered from below, and the attack that would be most dangerous to the fleet will be by airplanes unseen to their victims, attacking either by night or in cloudy weather or behind smoke screens, able to select the moment of attack and to sheer off if and when the situation is unfavorable.

It seems to me that Mr. McIntyre has chiefly in mind bombing attack in clear weather from a great height. To my mind, the great danger to warships from aircraft attack is, first from torpedo-carrying seaplanes attacking from behind smoke screens at a distance of 2,000 yards or thereabout.

Second, bombing attack from low altitudes in the night time or with partially obscure atmospheric conditions.

The task of dropping a torpedo at the right moment is a far easier matter than that of dropping a bomb at the right moment, for an error of ten seconds more or less will usually be immaterial in the case of a torpedo and absolutely fatal to aim in the case of the bomb.

Now with regard to the erratic behavior of torpedoes, Mr. McIntyre should give us accurate figures. Frankly, I have only seen two torpedoes fired, and one of them took a direct course from the axis of the tube till the bubbles disappeared over the horizon; the other turned at right angles in accordance with the setting of the gyroscope, and then took a straight course until it disappeared over the horizon. Now if fifty per cent of the torpedoes were to be erratic, the battle fleet would still be helpless against torpedo attack unless well defended by other aircraft.

The public will certainly be very much interested in quantitative figures as to the performance of our torpedoes.

GODFREY L. CABOT,
President, N.A.A.

Book Review

ENGINE DYNAMICS AND CRANKSHAFT DESIGN. By Glenn D. Angle (First Edition, 299 pages. Airplane Engine Encyclopedia Co.)

This book is the first of a series to be called The Airplane Engine Design series and is intended as a designer's handbook. Glenn D. Angle has already contributed The Airplane Engine Encyclopedia and numerous articles to literature and this volume is a valuable addition.

As it is intended to be a reference book, very complete tables and a bibliography are given after each main section. The method followed in treating the various phases of the subject is to give the basic theory and establish the formulae and then consider the materials and representative designs.

Although the design of airplane engines had its greatest impetus during the late world conflict, the more scientific developments have occurred since, and there is now a vast amount of data and experience available which should guide future developments along more constructive lines. An effort has been made to simplify and condense this material into suitable form for the use of the designer and yet retain its value to the student or those desiring to check certain equations developed. On the whole, the methods employed are quite similar to those in general use and the advantages in the present treatment lie in their simplicity. The methods for investigating the stresses and bearing loads of crankshafts have probably never been presented before in such a complete form.

Horatio Barber Sails

Horatio Barber, senior member of Barber & Baldwin, Inc., of New York, aviation consultants sailed for England on June 20. Mr. Barber, who is internationally known as an aeronautical engineer and expert on air transport, will return to the United States we are informed, about the end of July.

Mr. Barber has for seventeen years been active in aeronautics. He is one of the pioneer pilots and designers of England and designed built and flew the first all-British airplane. He served throughout the war as an officer in the Royal Flying Corps and since the armistice has been identified with government and private aeronautical interests in a consulting capacity. Mr. Barber is the author of several aeronautical books, among them "The Aeroplane Speaks," which was adopted by the United States and British governments for the instruction of officers.

During the present period of organization of air transport lines, it is a fortunate circumstance that the services of experienced and reliable aeronautical consultants is available for technical information and advice on the varied and intricate problems which must be solved before commercial air transportation can be established upon a sound business basis.

A New Record

A new record for speed over 500 km. with 250 kg. of test was made in Italy, May 5, when a Fiat CR covered the course at a speed of 250 km./hr. The course was 125 km. in length and was bounded by Montecelio, Cerveteri and Ostia. The machine was piloted by Major DeBernardi. The Fiat CR is a pursuit machine with a 300 hp. Hispano Suiza engine.

N. Y. U. Aero Course Endowed

Daniel Guggenheim Gives a Half Million Dollars to Construct Buildings and Support a School of Aeronautics at New York University

Chancellor Brown of New York University announced June 14 the gift of $500,000 by Daniel Guggenheim to establish a School of Aeronautics in the University's College of Engineering. Mr. Guggenheim's gift was actuated by a desire "more quickly to realize for humanity the ultimate possibilities of aerial navigation" and "to give America the place in the air to which her inventive genius entitles her."

Mr. Guggenheim's letter of June 12, offering the gift, said:

"Elmer Ellsworth Brown, Esquire
Chancellor, New York University
New York City
"My dear Chancellor Brown:

"For some time I have been impressed with the need for placing aeronautics on the same educational plane that other branches of engineering enjoy. It has seemed to me that aviation is capable of rendering such service to the nation's business and economic welfare as well as to its defense that our universities should concern themselves with the education of highly-trained engineers capable of building better and safer commercial aircraft, and industrial engineers capable of making the operation of aircraft as a business proposition comparable to the operation of railroads. In this way we shall give America the place in the air to which her inventive genius entitles her.

"The great future of aviation and aeronautics is in the promotion of the arts of peace rather than war.

"Already, we have the air mail, the use of airplanes in surveying, in photography, in prevention of forest fires and in fishery to indicate to us how great are the possibilities for extending the usefulness of aviation outside of the wartime employment of airplanes, upon which the attention of aeronautical engineers was first concentrated.

"If we are quickly to realize for humanity and our country the ultimate possibilities of navigation of the air, we must have planes that are foolproof, stable, capable of recovering from abnormal positions, able to land in easily-available places, and with the necessary speed and carrying capacity. Even the layman can understand that these things and others that engineers are trying to accomplish require specialized study with special equipment, and I am informed that no adequate opportunity for such study and experimentation exists in this country.

"My family has long been identified with exploration beneath the earth. We have tried to assist in developments which would make mining more safe as well as more profitable and therefore of the greatest economic value. I have learned through my son, Harry F. Guggenheim, who was one of the first civilians to enter aviation and was a naval aviator overseas during the World War, of the plans of New York University to establish a School of Aeronautics in its College of Engineering.

"I take pleasure in making possible the accomplishment of that desire. I am handing you herewith my check for $500,000 and a deed of trust relating to the use of that sum for the foundation of a School of Aeronautics in New York University.

"I understand that approximately $225,000 of the fund will be required and is to be used for the purpose of building and equipping a building, a wind tunnel, propeller laboratory, sand testing laboratory, model shop, full flight laboratory, power plant laboratory and classrooms. I understand that the balance of the fund will be required to provide for the salaries of a professor, an assistant professor and instructor of aeronautics and two research assistants and also for the maintenance of the building and equipment.

"The new field of employment and endeavor that aeronautical engineering will open to young men is one of the many reasons why this gift is made. Here is an uncrowded profession, offering opportunities unmatched in possibilities.

"I have created this trust with full confidence that it will be ably and wisely administered by your great institution and that it will promote the welfare of our country in time of peace and the safety of our country against aggression in time of war.

"With my heartiest good wishes, I am
"Sincerely yours,
"DANIEL GUGGENHEIM."

Chancellor Brown's letter accepting Mr. Guggenheim's gift was as follows:

"June 12, 1925

"My dear Mr. Guggenheim:

"In acknowledging your gift of $500,000 to establish a School of Aeronautics in the College of Engineering of New York University, I must first express on behalf of the University my deep thanks for your generosity. You have taken a step which will enable us to render a national service in a field of engineering now but scantily provided with means of study

"While in Germany there are eleven institutions giving aeronautical instruction under the supervision of the Ministry of the Interior, and in England, France and Italy a number of schools specializing in aviation and aeronautics, in this country there are only three such schools, of which New York University has the only one giving a full four-year undergraduate course.

"Necessarily, the development of aviation has up to this time been in the hands of military engineers and practical men, although the problems involved require the most intensive study of aerodynamics, thermodynamics, stability and other problems which only specialized investigation and training can solve.

"We accept your gift in the spirit in which it is offered, namely, that of carrying out a truly national service containing the possibilities of immense benefits to mankind, and opening the door to careers which promise to benefit our people no less than have the accomplishments of other branches of science and enginering.

"We shall, with your consent, name the new school to be established in the College of Engineering of New York University with the funds you have provided, the Daniel Guggenheim School of Aeronautics.

"With renewed thanks for your assistance, and assuring you that you have inspired us with great hopes of the good that may come from the study and training now made possible, believe me

"Very sincerely yours,
"ELMER ELLSWORTH BROWN, *Chancellor.*"

Primarily, the consideration that led to the gift by Daniel Guggenheim of $500,000 for the School of Aeronautics at New York University, was the belief that by intensive investigation and study aviation could be made a real public utility.

These possibilities are evidenced in the declaration by the Chamber of Commerce of the United States that

"The development of aeronautics in the United States is of growing importance for the transportation of valuable commercial commodities, for business mail, for engineering purposes and scientific investigation, for patrol of forest reserves against the constant menace of fire, and for the national defense."

On this subject, General Pershing recently said:

"The subject of aeronautics is especially appealing to every thoughtful man as one that should, and no doubt will, engage the attention of our most progressive engineers. Its future as a means of commercial transportation can hardly be foreseen by any of us, and the great progress that has been made during the last few years is sufficient basis for the most optimistic hopes. America with her inventive genius and her facilities for manufacture should not be content with second place in the development of air transportation.

"To my mind, the encouragement of commercial aviation is necessary to the full development of military aviation. It need not be pointed out that aviation has come to be a most important, if not a vital, factor in national defense. Manufacturing facilities for building planes for the transportation of the mail, express, passengers and freight could be instantly utilized to construct planes for defense. So that those who devote themselves to the advancement of aviation are really performing a distinct national service."

Secretary Weeks has expressed a like opinion:

"Scientific research and experimentation in aero-dynamics, the design and construction of aeronautical equipment, and the organization and operation of aviation companies are important.

"The progress and success of aeronautics will be dependent on the men who are thoroughly educated and trained in these professions and many of these men will come from our colleges and universities providing for such courses of instruction. Young men in deciding upon a professional career along scientific and engineering lines already realize the unlimited possibilities of aeronautics and wil enroll in coleges and universities providing an education for these professions.

"As an alumnus I am very proud of the fact that the New York University is among the first of our educational institutions to add this branch of science and engineering to its curriculum. As Secretary of War, I thank you for this cooperation and assistance in promoting our national defense."

These and similar views from other authorities, of course, had their part in influencing Mr. Guggenheim's decision.

Moreover, this country is peculiarly in need of commercial aviation. Owing to its long sea-coast and to modern developments in warfare, it is recognized that aircraft are a prime necessity for the national defense. President Coolidge has stated:

"Today, the outstanding weakness in the industrial situation as it affects national defense is the inadequacy of facilities to supply air service needs. The airplane industry in this country at the present time is dependent almost entirely upon governmental business. To strengthen this industry is to strengthen our national defense."

The Department of Commerce, in studying the need for commercial aviation, reports:

"There are indications of a great change in the last few months which has given an impetus to plans for developing American civil aeronautics that is bound to produce some permanent results. The extent of our country, its physical characteristics and its intimate contact with Canada, Mexico and the West Indies are such as to make air service highly desirable. The success of the trans-continental air mail operated by the Post Office Department and the general approval which has greeted its operation indicate that the choice of a method for developing civil aeronautics in the United States is the question demanding immediate solution, particularly since there exist no such political, financial and legal obstacles as have created difficulties for foreign countries. *There is every reason to hope that before the end of the present year, civil aviation in the United States will have taken a long step forward toward a position of permanent security.*"

Professor Klemin of New York University has declared that:

"The time has now definitely come for a different orientation in the design and operation of aircraft. Safety, commercial pay load and scientific ground organization should now be considered of primary importance.

"Progress is dependent on this new orientation. This change of aim is in turn dependent on the extent to which men can be trained who will be free from the prejudices and tendencies of war time construction, and who will turn thir energies to the design of safe and economical craft."

Curtiss Building New Commercial Ship

New Machine Using the OX5 Engine Embodies the Accumulated Experience of Years

After a careful survey of commercial conditions the Curtiss Aeroplane and Motor Co., Inc., have decided to build in production a popular-priced three-place commercial plane to be known as the "Lark." During 1924 the company disposed of all of its Standards and most of its JNs. These airplanes have served their purpose. They have provided at small cost the means for many pilots to continue in business. They have enabled thousands of Americans to enjoy flights and have thus converted many to a closer understanding of and enthusiasm for aviation. They have created a market for a reliable machine at a reasonable price.

Naturally, first thought was given to the engine, the heart of the airplane. No aeronautical engine is so widely known and so universally respected for its economy, reliability and simplicity as the OX5. There are a large number of these available at ridiculously low prices, as well as a vast quantity of spares. Consequently, a machine built around this engine combines reliability and economy of cost and of upkeep. Furthermore, modern engineering development makes possible remarkable performance on relatively low horsepower. With a high speed of approximately 95 mi./hr., a landing speed of less than 45 mi./hr., a cruising radius with full load of approximately 500 mi., a quick take-off and good climb—the Lark gives promise of performance suitable for present commercial flying.

The plane itself, constructed with an ample factor of safety throughout, conforms with Army specifications and is built under Curtiss inspection. With a view to standardization and low upkeep it is so designed that all control surfaces are interchangeable—a Curtiss patented feature. Instead of carrying seven different control surfaces for spares, the pilot need carry but one. Wings, interplane and landing gear struts are also interchangeable, as the machine is built without the usual center section. Naturally these features lend themselves admirably to lower production costs. At first sight, the squarely cut-off panels and surfaces look crude in comparison with the usual elliptical ends, but careful research and test has proven that the loss of aeronautical efficiency in this type of construction on a machine of this speed is only about one per cent, which is negligible in comparison with advantages gained.

The landing gear is of the split type without axle or spreader bar a great advantage in taking off or landing in fields with high grass, weeds, bushes, stumps or mud. The radiator is situated under the engine and conforms with the general streamline of the ship. The machine is equipped with the Curtiss-Reed Duralumin Propeller, well known for its efficiency and durability—a sales argument in itself. The engine mounting is attached by four bolts and where time is paramount, it is possible to quickly remove and replace the entire engine installation.

Special attention has been given to accessibility. Cowls are so designed as to be completely removed in a few seconds. Water and oil can be easily drained—tail skid assembly can be quickly dismantled and repaired. In fact, the general layout is a joy to the mechanic as well as to the pilot.

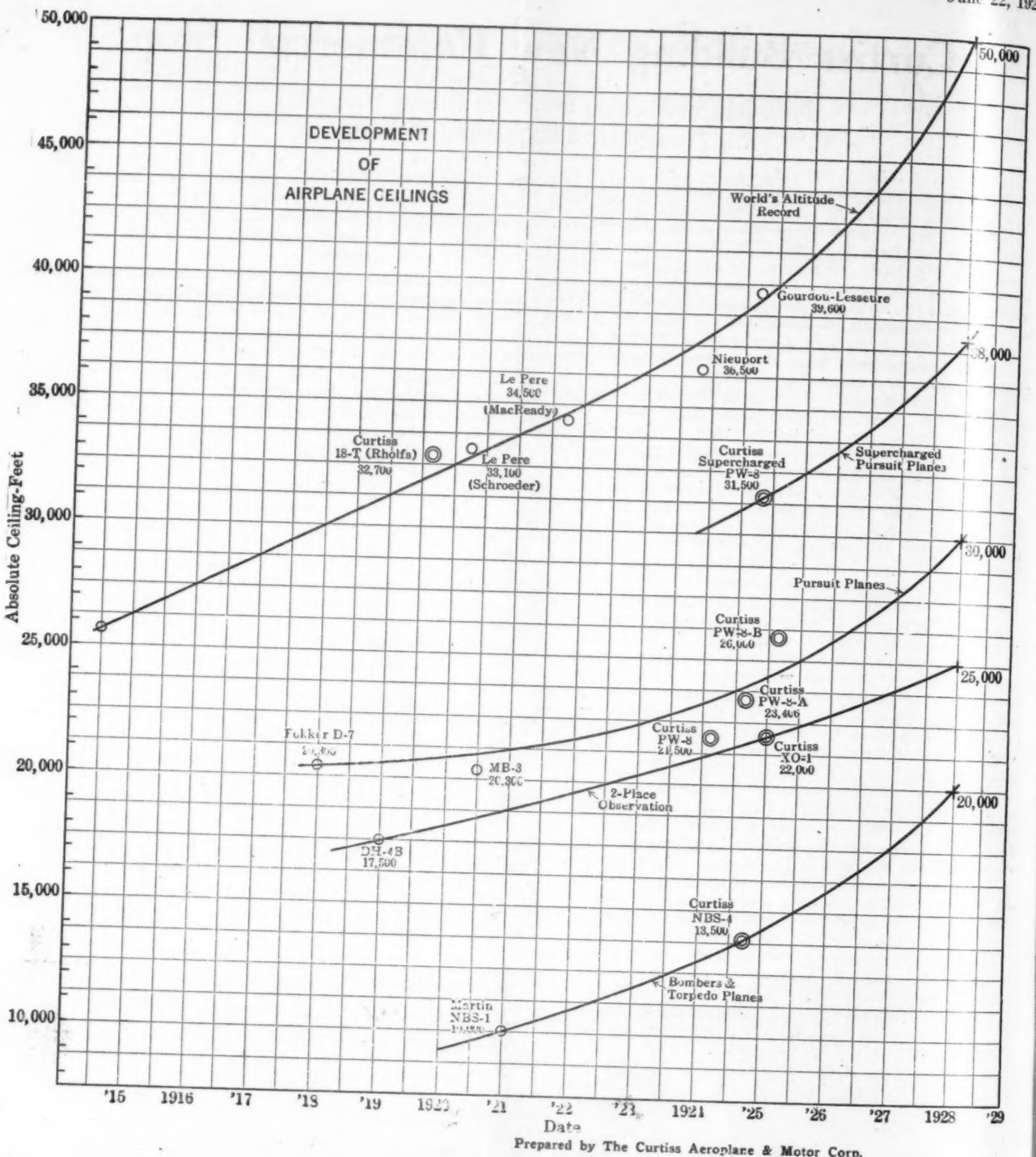
The fuselage is of steel tube construction with fabric cover—following the latest approved methods. The two passengers are seated side by side on a commodious seat protected by a windshield, with excellent vision. The pilot's seat is so adjusted as to give him excellent visibility without sacrificing comfort.

A number of these machines are now under construction in the Curtiss factory at Garden City. Some of these will be put into immediate service by the Curtiss Exhibition Co., where they will undergo all sorts of tests under actual operating conditions. A machine will be flown around the country where various pilots will be asked to fly it and their opinions and suggestions sought—so that all the so-called "bugs" will be removed and the best possible machine developed before actual production begins.

The Lark, combining reliability, economy of cost and upkeep, good performance, standardization of parts, complete accessibility, good visibility and comfort, promises to be a machine which will fill a commercial demand and which will uphold the well-known Curtiss reputation.

The development of the Lark by the Curtiss Co. has a two-fold purpose. Training planes are being built for the U. S. Army and Navy Air Services, the latter with pontoon equipment. These training machines will be identical with the commercial Lark, excepting that they will be propelled by engines of higher power—the Hispano E-2 for the Army and the Wright Whirlwind (J-4) radial for the Navy. All parts of these planes will be interchangeable with those of the commercial machine. Thus a machine is provided for advanced training, developing in the commercial field a reserve of trained personnel who are immediately available for military training in the same ship in case of national emergency. Standardization in aircraft equipment and operation is the most important line of development required for the prompt expansion of our military air forces.

The wind tunnel model of the Curtiss Lark



Prepared by The Curtiss Aeroplane & Motor Corp.

Insurance Survey

Following the suggestion of Gen. Mason M. Patrick, head of the Army Air Service, in an address before the Association of Life Insurance Presidents, that there should be a review of the entire subject of aviation hazards and their relation to life insurance practice, several companies have combined to undertake such an investigation, which will be conducted by Frederick L. Hoffman, Lld., consulting statistician of the Prudential Insurance Co. of America.

For many years Dr. Hoffman has been interested in the subject. As far back as 1919 he prepared a report for the National Safety Council as chairman of a special committee appointed for the purpose. Dr. Hoffman is in touch with the military, naval, postal and other authorities as well as with private corporations engaged in commercial flying. He also will consider the experience which has been had abroad. He is said to be strongly of the opinion that this country is on the eve of far-reaching developments in commercial flying, and predicts that within ten years commercial flying will be commonplace.

Dr. Hoffman expects to make a number of flights this summer to familiarize himself with aviation technique, the effects of flying at reasonable altitudes and the possible benefits of medical examination of aviators.

Aviators are among the few classes of workers still regarded as impossible life insurance risks. But General Patrick expressed the belief that hazards would be rapidly reduced as aviation equipment and skill further developed. He, as well as other observers, have pointed out that accidents are almost exclusively the result of stunt flying, and for justification of this view cite the experience of the aerial postal service which has been remarkably free from fatalities since its beginning.

"Who's Who in American Aeronautics"

The second edition of "Who's Who in American Aeronautics" will be published Sept. 1, 1925. Below will be found new biographies that will appear in the forthcoming volume. An invitation is extended to all pilots actively engaged in aviation military, naval or commercial to send their biographical sketches for insertion in the next issue. The book will contain the biographies of practically all the leading persons in American aeronautics. The price of the book will be two dollars. Orders are being taken in advance as the edition is limited.

Talbert Abrams

ABRAMS, TALBERT, Commercial Aviator; born, Tekonsha, Mich., Aug. 17, 1895; son of William B. Abrams and Sarah E. (Brunner) Abrams; married, Leota Fry, Jan. 15, 1923.
Educated: Public schools, Tekonsha, Mich.
Professional: Engineering Dept., Curtiss Aeroplane and Motor Co., 1917; Air Mail Repair Depot, Bustleton, Pa., 1920; Michigan Aero Service Corp., 1921; V. P. and Manager Michigan Airways, E. Lansing, Mich., 1922; President, A.B.C. Airline Corp., Eaton Rapids, Mich. 1923 to 1925.
Aeronautical Activities: Ground School, Pensacola, Fla.; Seaplane patrol, 1918, N.A.S., Miami, Fla.; 1st Div., Squadron E, Marine Aviation Force, Port au Prince, Haiti, 1919.
Flying Rating: Naval Aviator, May 1918.
War Service: U.S.M.C. July 17, 1917 to Dec. 23, 1919 as private to sergeant; commissioned 2nd Lieutenant AS-ORC 1923.
Member: F. & A.M. (32nd); I..O.O.F.; A.L.; N.A.A.; Mich. Reserve Officers Asso.; Com. Aero. Assoc., Mich.
Present Occupation: President and Manager, A.B.C. Airline Corp., Eaton Rapids, Mich.
Address: 210 Diana St., Eaton Rapids, Mich.

Charles Hayden Ames

AMES, CHARLES HAYDEN, Air Mail Pilot; born, Jackson, Mich., Feb. 2, 1894; son of Charles Chippman Ames and Anne Western (Hayden) Ames.
Educated: Los Angeles Polytechnic High School.
Professional: Redlands National Bank, Redlands, Calif., 1913 to 1916; So. Calif. Edison Co., Kern River, Calif., 1916-1917.
Aeronautical Activities: Enlisted Rockwell Field, San Diego, Calif., 1917; Ground School S.M.A. Berkley, Calif., March 1918; Flying Cadet Mather Field, Sacramento, Calif., 1918; Student, Instructor's Gosport School, Brooks Field, San Antonio, Tex., 1918; Instructor, Brooks Field, 1918-1919; Instructor, Kelly Field, San Antonio, Tex., 1919; Instructor, Curtiss Indiana Co., Kokomo, Ind., 1920; U. S. Air Mail Pilot, Dec. 8, 1920 to present date.
Flying Rating: Pilot's Certificate, No. 4247, F.A.I.; Reserve Military Aviator, 1918; Junior Military Pilot, 1920.
War Service: 1917 to 1919.
Member: Concordia Lodge No. 345 F. & A.M.; McKinley Chapter No. 181 R.A.M.; B.P.O.E. No. 583, Redlands, Calif.; Air Mail Pilots of America.
Present Occupation: U. S. Air Mail Pilot.
Address: U. S. Air Mail Station, Cleveland, Ohio; home, 830 Melrose Hill, Los Angeles, Calif.

Walter Henry Barling

BARLING, WALTER HENRY, Aeronautical Engineer; born, London, England, Jan 10, 1890; son of Walter Edward Barling and Anne (Head) Barling; married, Jessie Elizabeth Caddy, Nov. 5, 1917.
Educated: Polytechnic, London; Royal College of Science (ARC Sc); City Guilds College, B Sc., London.
Professional: 1905, Engineer apprenticeship for 5 years; Whitworth Exhibitioner 1910; Finished course of study at Royal College of Science (London) in 1912; Royal Aircraft Factory, England.
Aeronautical Activities: 1914, designer of propellers and in charge of stressing department, Royal Aircraft Factory; in charge of Technical Office, R.A.F. until 1918; Chief Engineer, Tarrant Aircraft Company 1918-1919; designed Barling Bomber for U. S. Air Service; 1920, Consulting Engineer, Wittemann Aircraft Factory; 1920 to 1923, Consulting Engineer to Engineering Division, Air Service in connection with erection and trial flights of Barling Bomber; 1924, Consulting Aeronautical Engineer; 1925, Chief Engineer, Lawson Aircraft Company.
Member: Royal Aeronautical Society (Associate Fellow); S.A.E.
Present Occupation: Chief Engineer, Lawson Aircraft Company.
Address: 1819 Broadway, New York City; home, 212 Lexington Ave., Dayton, Ohio.

Luther K. Bell

BELL, LUTHER K., Traffic Manager, Air Mail; born, Topeka, Kan., July 11, 1887; son of M. L. Bell and Anna (Oaks) Bell; married, Frances Johnson, April 27, 1912.
Educated: Kansas City, Mo. and San Jose, Calif.
Professional: Newspaper reporter and editor; contributor to magazines; San Jose (Calif.) *Mercury,* San Francisco *Examiner,* St. Louis *Republic,* Indianapolis *News,* Chicago *Herald,* Chicago *American,* 1914 to 1918.
Aeronautical Activities: Director of information, Manufacturers' Aircraft Ass'n., December 1918 to July 1922; Secretary, Aeronautical Chamber of Commerce of America, July 1922 to June 15,1924; Editor, Aircraft Year Book, 1920 to 1924; since June 15, 1924, Traffic Manager, U. S. Air Mail Service.
Books Written: . . Editor of Aircraft Year Book, 1920, 1921, 1922, 1923, 1924.
Address: Post Office Dept., Washington, D. C.; home, 42 Fern St., New Rochelle, N. Y.

William Henry Bleakley

BLEAKLEY, WILLIAM HENRY, 1st Lieut. Air Service; born, Ireland, March 22, 1890; son of George Bleakley and Anna Eliza (McCoy) Bleakley; married, Norma Edwina Hinkle, Dec. 2, 1917.
Educated: Trinity, Dublin, Ireland, 1903-1904.
Professional: Arrived in the U.S.A. 1905; University of Minn. 1906-1907; Western Electric School of Telephony, 1908.
Aeronautical Activities: Started flying March 1909; joined the Benoist Aircraft Co., St. Louis, 1911; taught flying and tested many types of biplanes and monoplanes up to 1916; instructor in flying, U. S. Army from 1916 to 1918; commissioned, 1st Lieut., Brooks Field, Oct. 26, 1918.
Flying Rating: Pilots' Certificate, Aero Club of America, No. 206, Jan. 29, 1913.
War Service: Civilian Instructor, U. S. Army; 1916 to Oct. 26, 1918; commissioned 1st Lieut., Air Service, Oct. 26, 1918.
Address: Phillips Field, Aberdeen, Md.; home, 170 Franklin St., Hempsted, L. I., N. Y.

Guy E. Burns

BURNS, GUY E., Commercial Aviation; born, Lima, N. Y., Aug. 9, 1897; son of John Burns and (Lockwood) Burns.
Educated: Fenton, Mich. High School.
Colleges: Lansing Business; S.M.A., Cornell.
Professional: Packard Motor Car Co., Detroit, 1917-1918; Arctic Ice Cream Co., Fenton, Mich., 1919-1920; 4 years, Commercial Flying, Burns Flyers.
Aeronautical Activities: Enlisted Jan. 28, 1918; S.M.A., Cornell; 339 Aero Sq.; 4 years commercial flying, Burns, Flyers, 1921 to 1924; pilot, Dayton Races, 1924.
Flying Rating: N.A.A. Certificate No. 6175.
War Service: Air Service, 1918-1919.
Member: American Legion.
Present Occupation: Commercial Aviation.
Address: Fenton, Mich.; home, 609 S. Le Roy St., Fenton, Mich.

Earl K. Campbell

CAMPBELL, EARL K., Commercial Aviation; born, Oct. 1, 1897, Sioux City, Ia.; son of Clarence H. Campbell and Ida E. Campbell.
Educated: Student in Highland Park University, Des Moines, Ia. at outbreak of the World War.
Aeronautical Activities: Enlisted Signal Corps; graduated from S.M.A., University of Texas; primary training, Park Field, Memphis, Tenn.; commissioned 2nd Lieut., A.S.; instructor until Jan. 29, 1919; transferred to Ellington Field, Houston, Tex.; discharged April 6, 1919; established the first commercial field in Iowa, May 23, 1919, Waterloo, Ia.
Present Occupation: Proprietor of the Campbell Airplane Co.
Address: Campbell Airplane Co., Moline, Ill.; home, 515 18th St., Moline, Ill.

Arthur Lefroy Caperton

CAPERTON, ARTHUR LEFROY, Aviator; born, Pueblo, Col., July 3, 1898; son of Clifford Randolph Caperton and Helena (French) Lefroy; married, Martha Diane Voight, Sept. 4, 1923.
Educated: National Cathedral School, Washington, D. C.; McGuire's Univ. School, Richmond, Va.
Professional: Executive training school, 1915-1916; Winchester Repeating Arms, Co., New Haven, Conn.
Aeronautical Activities: Cadet, ASSRC, April 1918; S.M.A., Ohio State Univ.; Ground School, S.M.A., Princeton, Aug. 10, 1918; primary flying training, Park Field; discharged, March 1919; 2nd Lieut., Aviation Section, U. S. Marine Corps., May 5, 1919; Sqd. B, Marine Air Force, Marine Barracks,. Parris Island, S. C. and Quantico, Va.; resigned, June 1920.
Flying Rating: Naval aviator No. 2873 May 1919; A.P. (A.S.) No. 6846, Dec. 22, 1922.
Member: N.A.A.; County Club of Va.; Army and Navy Club; Port Washington Yacht Club.
Present Occupation: Pilot with Curtiss Exhibition Co.
Address: Curtiss Field, Garden City, L. I., N. Y.; home, 32 Carlton Ave., Port Washington, N. Y.

Earl Carroll

CARROLL, EARL, Theatrical Author, Composer, Producer; born, Pittsburgh, Pa., Sept. 16, 1892; son of James Carroll, and Elizabeth (Wills) Carroll; married, Marcelle Hontabat, Oct. 25, 1916.
Educated: Pittsburgh Public Schools.
Professional: Author and composer of the following musical comedies and plays: 1914, "Pretty Mrs. Smith"; 1915, "So Long Letty"; 1916, "Canary Cottage"; 1916, "Florabelle"; 1917, "Love Mill"; 1919, "Lady of the Lamp"; 1919, "Daddy Dumplins"; 1922, "Bavu"; 1920-1922, "Jim's Girl"; 1923, "Earl Carroll Vanities"; 1924, "Earl Carroll Vanities"; 1925, produced "White Cargo"; 1925, produced "The Rat."
Aeronautical Activities: Enlisted in Inf. as Private, 1917; transferred, A.S.S.C., 1917; Ground School S.M.A., Austin, Tex.; elementary flying with R.F.C., Benbrook Field, Ft. Worth, Tex.; Com. Lieut., 1918, Taliaferro Field, Tex.; First Provisional Wing, Hazelhurst Field, L. I., N. Y.
Flying Rating: F.A.I. Pilot's Certificate No. 206.
War Service: 1917 to 1919.
Member: The Lambs Club; The Friars; Lotus Club; American Legion.
Present Occupation: Author, composer and producer.
Address: Earl Carroll Theatre, 755 7th Ave., New York City.

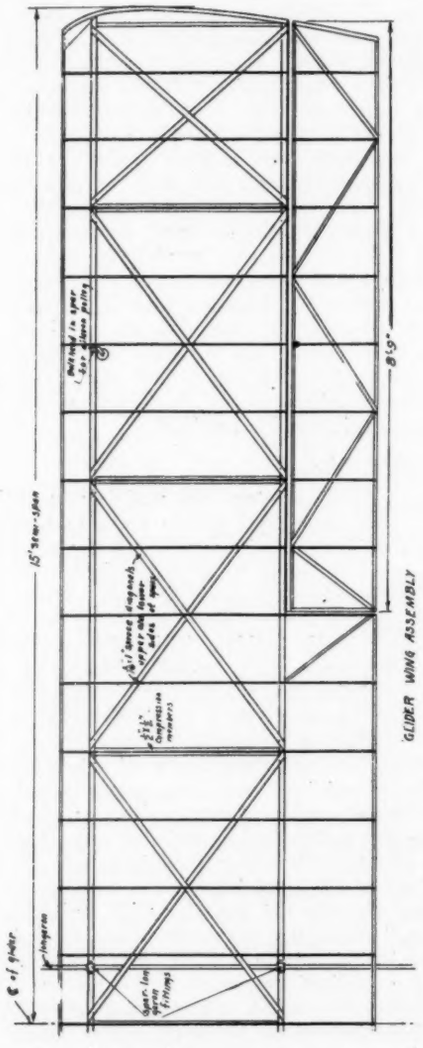
John Martin Clark

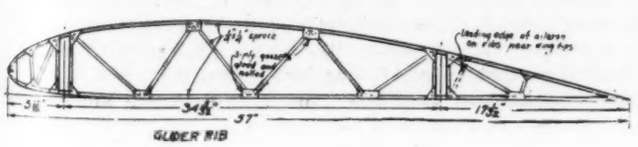
CLARK, JOHN MARTIN, 1st Lieut., Air Service; born, Lockhart, Tex., Nov. 1, 1893; son of W. J. Clark and Martina (White) Clark; married, Dorothy H. Hilgers, April 5, 1915.
Educated: Lockhart High School, San Antonio Business College.
Professional 1910 to 1913, State Bank & Trust Co., San Antonio, Tex.; 1913 to 1918, Kuntz-Albaugh Lumber Co., San Antonio, Tex.
Aeronautical Activities: Kelly Field, 1917; Aviation Ex. Bd., Fort Sam Houston, 1917-1918; Eng. Officer, Brooks Field, 1918-1919; Eng. Officer, Barron Field, 1919; Eng. Officer, Kelly Field, 1919; Eng. Officer, Operations Officer and Adj., First Surveillance Group. Ft. Bliss, Tex., 1919-1920; Depot Sup. Officer, S.A.A.I.D., 1920-1921; Op. Officer, France Field, Canal Zone, 1921 to 1924; Adj., S.A.A.I.D., 1924-1925; Depot Sup. Officer, S.A.A.I.D., 1925 to date; Advance Agent, Central American Flight, 1923.
Flying Rating: A.P., 1918.
War Service: U.S.A.S., Cadet, Sept. to Dec. 1917; 1st Lieut., 1917-1918; Capt., 1918 to 1920; 1st Lieut. Air Service to date.
Present Occupation: 1st Lieut., Air Service.
Address: San Antonio Air Intermediate Depot, Duncan Field, San Antonio, Tex.

The simplest method of hinging the ailerons is at the bottom, leaving a V slot at the top which can later be covered with celluloid or rubber. The leading edge of the aileron may be made of 0.25 in. spruce and the ribs set into it. This will be found too flexible unless cross torsional bracing is added to both the top and bottom as with the wing. The last ribs will have also to be braced laterally against the pull of the cloth.

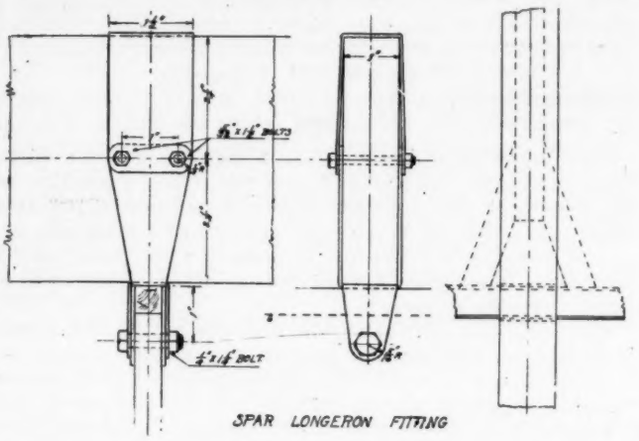
The metal fittings required on the wing will be 4 main spar-longeron fittings; 6 aileron hinges; 2 aileron horns; 4 aileron control pulleys.

The four main fittings are to be made of cold rolled steel 0.03125 in. thick. They are cut out according to pattern and bent as shown. The illustration shows the fittings for the front spar. Those for the rear will be identical except for 0.500 in. less height. Small brass hinges, if of sufficient strength to insure a rigid attachment to the spar and aileron leading edge, will be found satisfactory. The aileron horn should have a 3 in. arm above and below the hinge and should be very firmly attached to the leading edge of the aileron. The pulleys are attached to the rear of the front spar, two, one above the other at a point opposite the aileron horn, and the other two at the main spar fittings so that the aileron wire can pass downward to the control stick.





The wing covering should be of some lighter material than that normally used on airplanes. A light strong cotton balloon cloth weighing less than two ounces a square yard is obtainable and is very satisfactory. A special glider dope is also on the market for saving a few extra pounds of weight.



It will be found when the covering is put on the wing structure that it will tend to sag between the ribs especially at the leading edge. This can be prevented by covering the leading edge from the lower edge of the front spar around to its top edge with thin veneer, fiber, very thin duralumin or formica bakelite. Most of these materials will add materially to the weight of the wing and are undesirable for that reason, but so great is the importance of a good wing surface near the leading edge that it will pay to take some measures to prevent this uneven surface if it can be accomplished easily. It can be seen that the wing section in between rib stations is not at all the same as it is at the ribs when there is any sag of the cloth, and it is therefore useless to spend much effort making an accurate rib to the dimensions of the wing section unless one also endeavors to keep that section accurate throughout the entire wing. If some sort of stiff leading edge covering is not used, additional nose ribs should be employed. Neither of these precautions were taken on the original M.I.T. glider. It is quite certain that its performance would have been very materially improved and that it would have been much easier to get it off the ground if this had been done.

(The next article will deal with the fuselage and tail construction.)

A Long Island Aero Club Invites Members

The Aurora Aero Club of Glendale, L. I., would be glad to hear from all fellows interested in aviation living within a reasonable distance of their meeting house at Glendale. If they will correspond with John Dillman, of 121 Hale Ave., Brooklyn, N. Y., he will be glad to send full information. State your age and aero experience in letter.

German Gliding Competition

The third Coastal-Glider-Competition of the "Ostpreusische Verein fur Luftfahrt" was held from May 2 to May 17 near the fishing village of Rossiten on the Courland Spit in East Prussia. The longest flight was that of Fuchs in the "Alter Dessauer" of 7 hr. 45 min. 55 sec. Several other flights of over an hour were made during the meet. The only two-seater competing was the "Liegnitz D1" piloted by Seiler who established a new German record of 1 hr. 23 min. 38 sec. There was one machine, the "Espenlaub 7a," equipped with a German Viktoria "Hilfsmotor" (an engine that is not intended to sustain the machine but merely to assist it between gusts, hence help-engine). During the cross-country flights the following speeds were attained: "Konsul," 28 mi./hr., "Max," 23 mi./hr., and "Moritz," 26 mi./hr.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

The Building of a Glider

The M.I.T. glider discussed in the last article is a cantilever monoplane. In its modified form it appears below. Its span is 30 ft., its overall length 16 ft. and its aspect ratio, 6.38. The area is 141 sq. ft. and the total weight of the glider, 95 lb. If the pilot weighs in the neighborhood of 135 lb., the wing loading will be 1.63 lb./sq. ft., a loading which will give more satisfactory results to the average glider builder than the more usual heavier loading because of its ease in getting off the ground in light winds.

The wing section to be used is the Clark Y which combines a satisfactory spar depth, a good *L/D* and ease of construction in making the ribs. The wing is constructed of two box spars with ribs which are slid along the spars and glued and nailed in place.

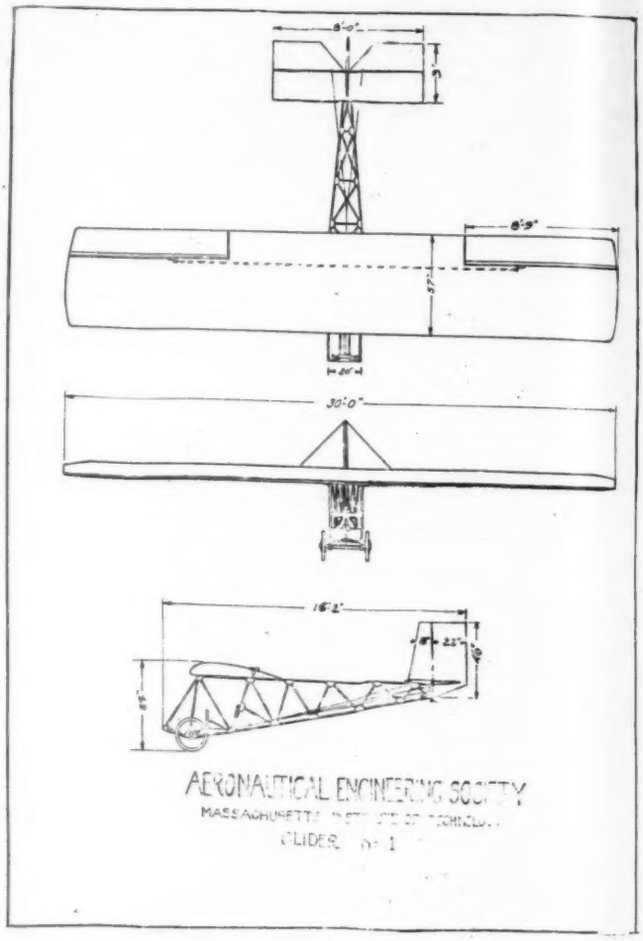
The first things to build are the ribs. They are made of spruce cap strips 0.25 in. square with the same size pieces as diagonals and uprights, and three-ply veneer gusset pieces glued and nailed at the junctures of all members. The ordinates for the wing are given in the following table.

Distance from leading edge. in inches	*Height of top surface. in inches*	*Height of lower surface. in inches*
0	2.0	2.0
1	3.4	1.0
2	3.6	0.65
3	4.6	0.49
6	5.7	0.25
9	6.3	0.15
12	6.55	0.04
18	6.75	0.00
24	6.45	0.00
30	5.9	0.00
36	4.9	0.00
42	3.8	0.00
48	2.35	0.00
54	0.85	0.00
57	0.07	0.00
Radius of leading edge,	0.85″	

The form for the rib should be made up on a heavy board 5 ft. or more long. Draw in the section exact size, according to the dimensions given in the table and tack in finishing nails along the lines to serve as a guide in bending the cap strips. It may be necessary to soak the ends of the strips to prevent their breaking in bending around the nose. When uprights and diagonals are in place, (see illustration) glue and nail the triangular plywood pieces as shown. Cement covered nails, number 19 or 20, 0.25 in. long should be used in the rib construction; 0.375 in. number 19 nails should be used for the spar construction. When the ribs are completed they can be slid in place along the spars and glued and nailed in the position marked.

The spars are built up box sections with spruce ends and three-ply sides. The spruce pieces are 0.375 in. × 0.8125 in. They are to be finished up in a planer or by hand. Splices should be made not over 6 ft. from the ends of the 30 ft. section. The splices should be scarfed and at least 4 in. long. The veneer sides are next made up by cutting in strips 4.5 in. wide and 4 in. wide sufficient plywood to make two strips 4.5 in. × 30 ft. and two strips 4 in. × 30 ft. The veneer can be spliced by butt joints with an inside cover plate, glued and screwed or nailed on. The veneer should be 0.0938 in. three-ply mahogany or its equivalent in strength.

The bulkheads must be prepared, one for each rib position making sixty in all if spaced one foot apart. Poplar or spruce 0.25 in. thick and 3 in. × 0.40625 in. for the front spar and 2.5 in. × 0.8125 in. for the rear spar will be satisfactory. Care must be taken to insure these bulkheads for each spar being all the same size. Six extra bulkheads about 1.75 in. thick are needed for fitting attachments. Four are placed 10 in. on each side of the center line. The fuselage longerons are 20 in. apart and the main fittings come at these points. The other two large bulkheads are placed just inside the tenth rib on each side of the center rib on the front spar to take the bolt holding the aileron pulleys.



For assembling the spars casein glue is most satisfactory. Glue and nail the bulkheads in place between the cap strips at one foot intervals and then glue and nail the veneer sides on the box The ends of the spars should be tapered down in elevation from the next to the last rib position. Diagonal torsion bracing can be put in at this time to stiffen the wing and make it possible to work on it without displacing the parts. This will consist of strips of spruce 1 in. × 0.625 in. × 60 in. crossing diagonally from front to rear spar, glued and nailed to both the top and bottom of the spar every 48 in. This cross work will add a very great deal to the rigidity of the structure. It may be found difficult to get the wing lined up accurately while putting in this diagonal bracing. It may be necessary to clamp the structure to a level floor during the operation.

The wings are now ready for the leading and trailing edges, which can be made of 0.875 in. × 0.500 in. strips set into the ends of each rib, and for the wing tips. These latter can be readily formed by turning sideways the last ribs with the flat sides inward. This will form a pleasing looking and fairly efficient wing tip. It must be braced and strengthened to provide a place for holding the wing on a windy day.

Nothing has been said thus far about the ailerons. The last eight ribs on each side can be cut off at the rear of the rear spar, and the portion removed used to make the ailerons.

a number of aerial views in the Sunday pictorial section of the *Journal-Post* have been made possible through the courtesy of Mr. Coburn. This company operates one Waco seven-passenger cabin ship, one Laird-Swallow and one LS5. These ships also are available for passenger service. R. Montgomery is chief pilot.

Then there is the Aircraft Sales Co. which carries on the good work at the present time with two new Waco's, piloted by John K. (Tex) La Grone and J. D. Brock. Tex is known all over the country and is one of the oldest pilots (in experience) who now handle the 'stick.' He is an excellent instructor, practical as well as theoretical, and has a number of students under his 'wing.' Mr. Brock is also a very able pilot.

Another 'old timer' is Blaine M. Tuxhorn, now flying an OX Standard, since his other plane, a LS5, was destroyed by the fire that completely demoralized the American Automobile Show at the American Royal Pavillion last December. He also is a pilot of wide experience and a very able instructor. And there is Ben Gregory and Kansas City's first 'aviatrix' Miss Freda A. Treadway. Miss Treadway is a very enthusiastic flier and just can't be kept off the field.

There are many others, so we will just name them and the type of plane. Shorty Long has a new Waco; the Higley Motor Co. purchased an XX Std; Charley Quinn, XX Standard; Walter Miller, JN4D; E. F. Spencer, XX Std.; P. Ferking, OX Std.; Earl Collins, OX Std.; Mr. Mitchell, Cannuck; Russell Dick, OX Std.; E. E. Porterfield, Laird Swallow; C. H. Hodges, Swallow; F. A. Morton, JN4D; and Jim Fero with a Roger Day.

Approximately 2500 flights were made by the above named planes during the past month and the passengers carried would number around 1500. About 30 commercial transient planes refuelled at Richards Field from states of the Central West, Kansas, Nebraska, Iowa, Oklahoma, Colorado, Texas and Illinois. However, the best months are yet to come, June, July, August and September and we anticipate a very busy summer. At least we expect to be able to give you more news in our next issue.

San Francisco

The Richmond municipal Airport consisting of 80 acres will be dedicated on June 27-28. This is the only municipal airport in the San Francisco Bay region, which has a population of over one million. Army, navy, air mail and commercial planes of all kinds will participate in the dedication and Air Meet. A sham battle which will include bombing planes, artillery, infantry and machine guns will be the concluding event of the meet on June 28.

This field, leased and maintained by the Richmond Chamber of Commerce, is for the free use of "anything that flies." Rather than make it a meet of thrillers it is going to be one of education for the public as to what can be expected from aviation. Practically every feat known to safe and sane flying is to be demonstrated. The value of aircraft to troops will be demonstrated in the sham battle through the various means of communication and aerial reconnaisance.

Deruluft Prices Changed

The air fares from Konigsberg to Moscow were reduced on June 1. The present prices are as follows: Moscow-Konigsberg, $50; Moscow-Berlin, including sleeping car, $65; Moscow-Amsterdam, $98; Moscow-London or Paris, $115. The freight and express schedule remains unchanged. Shippers of large quantities of goods may be entitled to a rebate.

Leipzig Airport

For more than a year Leipzig has been one of the few large cities in Germany that lacked regular airplane service. The municipal authorities now, however, reports Vice Consul F. van den Arend, have made arrangements with the two largest airplane companies in Germany—the Deutsche Aero-Lloyd and the Junkers-Luftverkehrs-Gesellschaft of Dessau, which is founding the Trans-Europa Union—whereby the following air lines will pass through Leipzig: (1) Berlin-Leipzig-Munich-Innsbruck (Aero-Lloyd); (2) Chemnitz-Leipzig-Hanover-Bremen (Aero-Lloyd); and (3) Breslau-Gorlitz-Dresden-Leipzig-Erfurt-Essen (Junkers).

All these lines are to be flown daily, starting not later than May 1. They offer good air connections with all the principal cities of Germany and with Amsterdam, Copenhagen, Danzig, Moscow, London, Paris, Stockholm, Zurich, and Vienna, thus placing Leipzig at the center of European airplane traffic.

The municipal government has invested 260,000 gold marks ($62,650) in the company which maintains the local aviation field, thereby becoming owner of 80 per cent of the company's shares. The municipality has also invested 350,000 gold marks ($84,337) in the Trans-Europa Union, representing 3 per cent of the company's stock. The Aero-Lloyd, on the other hand, has been granted a subsidy for the current year amounting to 70,000 gold marks ($16,867). It will be remembered in this connection that both the Aero-Lloyd and the Trans-Europa Union are subsidized by the German Federal Government, which desires to push the development of aviation in Germany. The municipal authorities are therefore supporting this national policy, as well as securing to the city the advantages of a regular airplane service.

The New Swallow used by the Alexander Industries of Denver for their salesmen

Latecoere Posts

The number of letters carried by the Latécoère Air Service between France and Morocco during February, 1925, was 368,180, weighing 8,035 kilos, compared with 232,709 letters in February, 1924, with 5,717 in the same month of 1920, and with 435,783 in January, 1925. The popularity of this service is said to be due to the appreciable saving in time (from four to seven days in winter) on the passage of a letter from Paris to Casablanca. The air service was carried on without interruption during very bad weather in February, when it was frequently impossible for the small ships that carry mail and, in fact, for large vessels, to enter the more or less exposed ports of Morocco.

Los Angeles, Calif.

Bell Airport, in the southeast corner of Los Angeles, two miles east of the Goodyear plant was officially opened to the public Sunday, May 17, with a wedding 3,000 ft. in the air, a half-score of flying events and a general air festival. The event was staged under the auspices of the Western Aero League, assisted by the Bell Chamber of Commerce.

Dr. T. C. Young of Glendale, president of the league, flew his large Argonaut to the airport and later took Charles Ross Adams and Miss Catherine Richardson, both of Bell, into the air for the wedding. The Rev. C. C. Loomis of Bell officiated. It was estimated that more than 20,000 persons witnessed the numerous events on the program.

Jack Frye of the Burdette Airdrome was high-point winner of the afternoon contests, taking first place in the relay race participated in by seven planes, and carrying away first honors in the dead-stick landing event. Bob MacDougall took second place in the latter event.

Frank Hefling furnished the stunts, hanging by one foot from a rope ladder and walking the wings of a plane piloted by MacDougall.

Dick Myhres and H. J. Keddy also participated in the flying.

The flying field is 2,000 × 2,000 ft., and is located in the heart of Bell. It is within six miles of the Los Angeles Arcade postoffice. Patrick O'Riley and Paul Nestor have the active management of the airport.

AIRPORTS AND AIRWAYS

Boston, Mass.

By Porter Adams

On Friday June fifth at noon a number of Army planes from the Boston Airport flew over the city in formation for the benefit of the American Legion Endowment fund drive which was going on at the time, and it was undoubtedly one of the most perfect formations which has ever been seen in this city. It attracted a great deal of attention and aroused much favorable comment.

Col. Benjamin F. Castle, the treasurer of the N.A.A. was in Boston on Saturday and Sunday of last week and Sunday morning he paid a visit to the Boston Airport. He expressed himself as greatly pleased with it, and was impressed with the opportunity there offered for expansion. Colonel Castle warmly congratulated Boston on its foresight in obtaining such a field so near the center of the city and hoped that New York in the near future could be similarly equipped.

On Sunday evening June 7, W.B.Z., the Westinghouse radio station of New England which has already become known as the "Aviation broadcast station" on account of the many air programs which it has given, broadcast a special program between 10 and 11 p. m. for the benefit of the American entries in the Gordon Bennett Race. The program included a short talk on the history of the race, a message to the pilots by Capt. C. S. Ford, Air Service officer attached to the first corps area, and messages of good luck from the following: General Patrick, Admiral Moffett, the officers and men of the Shenandoah, Col. B. F. Castle, Professor Edward P. Warner of the Massachusetts Institute of Technology, Godfrey L. Cabot, President of the N.A.A., P. W. Litchfield of the Goodyear Co., Capt. G. W. Steele of the Los Angeles and others.

The total flying time for Boston and vicinity during the last week was 119 hr. and 41 min., of which the Navy lead the field with 71 hr. and 21 min.; the Army followed with 32 hr. and 40 min. and the National Guard had 15 hr. and 40 min.

We are hastening away now to Technology to the all Technology reunion which opens June 11. There is a picnic tomorrow at which time naval seaplanes will give a demonstration, and following the close of the Technology program, Boston will be all enthused by the departure of the polar flight under the command of Comdr. R. E. Byrd June 17.

Essington, Pa.

The two first Aerial Squadrons formed in Pennsylvania during the War, namely 145th and 133rd Aero Squadrons held their Annual Dinner at this field (formerly Chandler Field on Saturday June 6) nearly sixty members were present and plans formed to take out a charter and form an active organization similar to the First City Troop in Philadelphia. Capt. Samuel H. Paul, A.S., O.R.C. who is mainly responsible for the success of these annual gatherings deserves a lot of credit for his untiring efforts to keep the Old Essington Birds together.

Long Island, N. Y.

The southern part of Curtiss Field, Garden City is full of stakes. All pilots are warned not to land south of the line of white flags. If landing at night do not land south of the light on the water tower.

Spokane, Wash.

By E. H. Partridge

An airplane was flown in Spokane entirely without gas recently when Pilot Nick B. Mamer took to the air with his tank filed with "Vegaline" an alcohol-base product made of potatoes and apples. The base is cut with a special formula which it is claimed permits complete gassification of the product. No changes in carburetor were necessary for use with the fuel.

Pilot Mamer flew the plane, powered with a Wright-Hispano engine to Wallace, Idaho, a distance of 60 mi., and return, then flew over the residence districts of Spokane dropping posters.

It is claimed to have been one of the first times in history when an airplane has been flown without gasoline or any petroleum product in any form.

National guardsmen have one of their three planes in the air again. Two are kept out of commission because no flying may be done without parachutes and there are but two chutes for the unit. Guardsmen hope to have four or more new parachutes here by July 1 but the cost is so high that funds have not yet been found available.

Waco, Texas

Waco Flying Field is a commercial field located 3 mi. west of Waco, on the highway. The field is square and contains 50 acres, has excellent approaches, and with the fast growing turf it now has, will soon be available in extreme wet weather. Field is marked by 200 ft. circle in center, three large wind cones, and four local ships in field. The equipment consists of gas and oil tanks and pumps installed on field with overhead hose making service speedy and safe. Field has water, telephone, and office which is equipped with ample locker space to care for visiting pilots equipment. Cars are kept on field at all times, as transportation to and from city free of charge to visiting pilots. The Hotel Raleigh gives attractive rates to all visiting aviators, compliments of the Waco Aviation Co. An Army Sergeant is stationed at the field to supervise the servicing of Government ships. Mechanics are on duty at "Waco" Field from day break to dark, every day. The field is managed by Al Henley recently of the U. S. Air Service, one of the most successful pilots in the United States.

Kansas City, Mo.

Local commercial aviators are untiring in their efforts to boost their own home town to the front in aeronautics. Although the field is approximately 15 mi. from the heart of the city, our pilots are found to be at the field from early morning until late at night, working on their planes so that these may be in perfect condition at all times for the maximum state of safety for the public. It is with satisfaction that we are able to announce an increase of the local pilots. New companies are being organized, new airplanes purchased and daily one may observe young pilot students busily engaged in practice flights or studying the function of airplane engines. Several of our local commercial pilots were instructors at large Army training camps during the recent World War. A number of well known Army aviators received their A-B-C of aviation from these pilots and we hope that the present crop of students will master the plane and its functions as have the boys of 1917 and later.

For those who are not familiar with activities at Richards Field we will name the pilots who have aircraft at the field and engage in the carrying of passengers and freight.

A newly organized company is the Kansas City Airways Transportation Co., which will operate from Richards Field with six Lincoln-Standard five-passenger cabin ships. The first of this type of plane has already been received and is ready for an inspection by the public at the field. The other five ships will be ferried to Richards Field in the near future. These planes are for the establishing of an air line between Kansas City, Mo., and Tulsa, Okla., and will carry passengers and freight. Mr. Cochran, late of the Lincoln-Standard Aircraft Manufacturing Co., has been appointed chief pilot for this organization.

Another company well known to Kansas Citians is the Kansas City Aero-Photo Co., headed by J. M. Coburn. Quite

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Chanute Field

On June 8, Flight Lieut. H. G. B. DeKruyff Van Dorssen, of the Netherlands Air Force, a student in the Parachute Course, Air Service Technical School, safely accemplished a live parachute jump from the cockpit of an airplane, height 2,000 ft. Lieutenant Van Dorssen is the largest man to ever leap from the cockpit of an airplane, voluntarily using a parachute. He weighs 220 lb., is 6 ft. 7 in. in height and thirty years of age. He is attending the Air Service Technical School for the purpose of determining the efficiency of the U. S. Army Air Service Parachute and the demonstration of June 8 thoroughly satisfied him on its merits.

It might be stated at this time that recent tests made by British and Canadian Fliers at this School were so satisfactory that the Royal Air Forces of England and Canada have adopted this parachute. The Air Service Technical School on May 12 held a parachute demonstration in which 17 jumps were made without injury from heights of 2,000 to 7,500 ft. and but three parachutes were used. As fast as one jumper landed his chute was hurried to the hangar and repacked for the next subject.

Fairfield A.I.D.

The shops of the Fairfield Air Intermediate Depot are busy these days. The following production was reported for the month of April: Airplanes— 4 DH4M1, 2 DH4B4, 7 Curtiss JNSE, 1 Curtiss JNSA2, 2 Curtiss JNSA, 2 Martin Bombers MB2 and 6 MB3A, total 24; Engines—11 Liberty 12, 1 Wright A, 5 Wright A-2, 23 Wright E, 4 Wright 1, 5 Wright H-3, total 49.

The repair shops, under the direction of Capt. Edward Laughlin have begun rebuilding Curtiss airplanes for the use of reserve officers during the summer training period. It is expected that 53 "Jennies" will be overhauled and reconditioned before the end of June. They will all be of the JNSE type, equipped with Wright E engines.

Army Air Orders

First Lt. Paul Evert, A.S., Scott Field, to Langley Field.

First Lt. William A. Gray, A.S., Brooks Field, to Kelly Field.

First Lt. Arthur B. Custis, A.S., Kelly Field, to Frankford Arsenal, Pa.

Sec. Lt. John G. Salsman, A.S., Chanute Field, to Scott Field.

Sec. Lt. Clyde Massey, A.S., Kelly Field, to Cavalry, Fort Brown.

Capt. James L. Hatcher, A.S., Kelly Field, to Washington.

First Lt. James W. Hammond, A.S., Chanute Field, to Kelly Field for instruction, upon completion of which to San Francisco, sailing on transport Sept. 3 for Philippine Is.

Maj. Robert Coker, Capt. Roland W. Wittman, First Lt. Neal Creighton and First Lt. Lawrence A. Lawson, A.S., Balloon & Air Sch., Scott Field, to report to commanding off. that station.

First Lt. Albert J. Clayton, A.S., Scott Field, to Langley Field.

First Lt. Leroy E. McGraw, A.S., Scott Field, to Phillips Field.

Majs. Fred H. Coleman and Michael F. Davis, Scott Field, to temporary duty Maxwell Field with summer training camps, upon closing of camps to Langley Field.

First Lt. Gerald E. Ballard, A.S., Middletown, Pa., to New York City, sailing Aug. 6 for Canal Zone.

First Lt. James P. Hodges, A.S., Mitchel Field, to San Francisco, sailing Sept. 3 for the Philippine Is.

Following officers A.S. Res., to active duty McCook Field, from places indicated, reverting to inactive status June 29: Capts. Falk Harmel, Washington; Dudley Sturges Norton, Babylon, N. Y.; First Lts. William Vail Lovell, St. Albans, N. Y.; Byron Goodes Cook, Lakewood, Ohio; Sec. Lts. Ralph McVean Cameron, Greenwich, Conn.; Carl Francis Clark, Fort Worth; Charles Francis Clevette, Watertown, Mass.; Lyman Hale Haggerty, Ipswich, Mich.

Capts. James Henry Sullivan, A. S. Res., Houston, and William Lawrence Purcelli, A. S. Res., Buffalo, to active duty Washington, reverting to inactive status June 29.

Brig. Gen. James E. Fechet, A. Ch. A. S., and Capt. Ralph P. Cousins, A.S., appointed to board called to formulate policy governing training of officers and enlisted men of the organized reserves, to meet in Washington.

First Lt. Ernest E. Harmon, A.S., Bolling Field, to McCook Field after temporary duty at Fairfield.

Maj. Roy S. Brown, A.S., Maxwell Field, to Kelly Field.

First Lt. James B. Carroll, A.S. Harvard University, upon completion of instruction to Maxwell Field.

First Lts. Frank M. Paul and Hobart R. Yeager, from A. S. Tech. Sch. to com. off. Chanute Field.

Sec. Lt. Howard H. Couch, A.S., Kelly Field, to Scott Field.

Sec. Lt. George C. Stewart, A.S. (Inf.), Kelly Field, to Fort Sam Houston.

Capt. Louis R. Knight, A.S., Boston, to San Francisco, sailing Sept. 3 for the Philippine Is.

Following officers assigned to stations indicated, in accordance with orders to be issued by Com. Gen. Phil. Dept.: Capt. Rosenham Beam, A.S., Kelly Field, First Lt. Robert E. Selff, A.S., Wilbur Wright Field.

Capt. Robert G. Ervin, A.S., San Diego, to Omaha.

Maj. Lawrence S. Churchill, A.S., Omaha, to Langley Field.

Loening Exploring Plane Designations

The three planes which Navy personnel will fly over the polar sea this sumer with the MacMillan expedition under the National Geographic Society have been given regular designations as Naval aircraft. They will be known as the NA-1, the NA-2 and the NA-3. This designation stands for the words Naval Arctic and the numerals give the identity of the respective planes.

Definite assignment of crews to the three amphibian planes has been made by Lieut. Comdr. R. E. Byrd, the senior officer of the Naval detail, as follows.

The NA-1 will be manned by Lieutenant Commander Byrd and Aviation Pilot Floyd Bennett. The NA-2 will be manned by Chief Boatswain Earl E. Reber, pilot, Donald B. MacMillan, navigator, and aviation machinist's mate first class Charles F. Rocheville. It is planned that these two planes will make the first flights in company out over the polar sea in search of the unknown land which is believed to exist between the North Pole and Alaska. The NA-3 will be manned by Lieut. M. A. Schur and Aviation Pilot A. C. Nold. The latter plane will remain at the advance base to be established on Axel Heiburg land and will be held in reserve as a rescue ship or to replace one of the other planes in the event of mishap. Aviation Chief Machinists Mate N. P. Sorenson will also be detailed to the advance base on Axel Heiburg land. Chief Aerographer Albert C. Francis will be the weather forecaster for the expedition and will set up a temporary laboratory on the base ship Peary at Etah for making weather observations and forecasts.

Arctic Navigation

Navigating the Navy planes which will fly over the trackless polar sea this summer in search of a new continent stands out as the major problem of the expedition. Lieut. Comdr. R. E. Byrd who with a detail of Navy fliers has been assigned to the MacMillan expedition under the auspices of the National Geographic Society has given intensive study to this phase of the expedition's problem. As a result of this study the most elaborate preparations ever made for a long distance flight by air will safeguard the success of the expedition and the safety of the planes and pilots.

Lieutenant Commander Byrd emphasizes the fact that in the area where the Navy planes will operate the ordinary magnetic compass will be practically worthless. He will have to depend on a specially developed sun compass, on radio direction signals sent out from his base and on the accuracy of his navigational sights of the sun and moon which will be made in flight.

* * *

The problem has been cogently summarized by Commander Byrd and interesting solutions set down in the following words:

Compass variation for our flight will vary from 100 to 180 deg., and when flying out over unexplored regions from Axel Heiburg Land will change every twenty minutes. No chart gives this variation, and it has been necessary, therefore, to work out theoretical curves of variation which may be in error as much as ten or fifteen degrees. Exact variation can only be found by practice with precise instruments. The variation in these regions has never been investigated.

Therefore dead reckoning, which was the only method used by the World Fliers and practically the only method now used in aviation, can not be entirely depended upon. Therefore methods of locating the position by celestial observation must be resorted to. The magnetic pole is 1200 mi. south of the North Pole, and at certain times of the flight we will be between the North Pole and the magnetic pole, many hundreds of miles north of the magnetic pole, and the compass needle will point approximately south instead of north.

* * *

Methods heretofore in existence for locating position in the Arctic regions by celestial observation have been long and cumbersome and required much mathematical calculation, and can not be done practically in an airplane in flight. Captain Bassett, in charge of the Hydrographic Office of the Navy, turned over to G. W. Littlehales, hydrographic engineer, the job of working out some short method of navigation that would be practical and simple. Mr. Littlehales, with his usual genius, hit upon a method of procuring a Summer Line by taking an altitude of the sun, which is far simpler than any methods heretofore utilized and which can be done graphically on a specially constructed chart, which does away with long mathematical calculations. This gives one line, and another line can be procured by taking the latitudes of the moon, which will be visible a large part of the time, and the intersection of these two lines will give the position.

* * *

Ordinarily navigators at sea, in order to locate their position, take the altitude of the sun above the horizon. In the Polar Sea this can not be done, due to the fact that the horizon is covered with ice and is so irregular. It therefore becomes necessary to supply this horizon in the instruments. The ordinary artificial horizon is far too heavy to carry on a plane. The Navy has developed an artificial horizon sextant which supplies this horizon by means of a bubble. When this altitude is taken the Greenwich Mean Time must be known. Every ship carries two or three chronometers which are very finely made and which give the Greenwich Mean Time. These are too big to carry on the planes, and specially constructed small chronometers must be used. These chronometers will be set to Greenwich Mean time and Greenwich Sideral Time.

There are likely to be strong winds over the Polar Sea. If the wind is blowing 30 mi./hr. from the right or left of the plane, the plane will be taken 30 mi./hr. out of its course. If the wind is blowing from the left, at this rate for 3 hr., the plane will be about 100 mi. away from the course it should be on. It becomes absolutely necessary then, to allow for this drift from the wind. For the first trans-Atlantic flight the Navy designed such an instrument which worked satisfactorily, and a modification of this will be used on this flight. It is used in conjunction with smoke bombs which are thrown on to the ice or into the water on the Polar Sea, and sights are taken on the smoke thus made. In other words there must be some definite object beneath the plane to sight on. With this instrument the direction over the ground can be procured, and the speed of the plane through still air being known a methematical computation of the speed of the wind can be calculated. The Navy has designed a computator which enables these computations to be made graphically without recourse to trigonometry.

No chart now in existence gives the theoretical variations in the area to be flown over. Mr. Littlehales has worked out these variations so they may be within an error of 10 or 15 mi. He has put them on a specially constructed chart for the use of the navigators. When the Navy made the first trans-Atlantic flight Mr. Littlehales supplied the short methods of navigation which included a specially constructed zenithal projection chart which gave at that time the shortest and quickest method known to man of calculating position by astronomical observation.

* * *

The navigators cockpit on a very miniature scale will be arranged just as the navigators chart room on board ship. The chart generally used at sea on steamers for plotting the course is a Mercator chart, on which, for distances of 500 or 600 mi., the course is a straight line. This chart can not be applied to the region around the North Pole. On a Polar chart this straight line becomes a spiral. It is extremely difficult to follow a spiral in an airplane, or even with a steamer. It would be almost impossible to lay down a straight line on the chart and follow it, because every instant the true course and variation would change, and to this change would have to be added the drift of the plane caused by the wind. To overcome some of these difficulties a sun compass is being constructed which will enable the pilot to steer by the shadow thrown by the shadow pin on the compass. This will still make the following of any pre-determined course a spiral, but the variational errors will not enter in, as the sun compass is independent of terrestrial magnetism.

In order to prevent confusion from the tremendous variations of 180 deg., the Secretary of the Navy suggested that instead of using longitude and latitude from the North Pole, that a system of coordinates be used working from the north magnetic pole. These meridians could be called magnetic longitude and latitude. Variations of the compass for as much as 180 deg. then would not have to be applied to the compass correction. A chart has been constructed by using this system of coordinates and will be used on the flight.

U. S. NAVAL AVIATION

Naval Air Orders

Lt. Comdr. Joseph M. Deem det. Nav. Air Sta., Lakehurst to command U.S.S. Sharkey.

Lt. Comdr. Thales S. Boyd, det. Navy Yard, New York, to Nav. Air Sta., Lakehurst.

Lt. Comdr. George L. Wayler det. Nav. Air Sta., San Diego, to Navy Yard, Mare Island, as aide to commander.

Lt. Raymond E. Farnsworth det. VO Sqd. 2 Aircraft Sqds., Battle Fleet to U.S.S. Colorado.

Lt. Arthur W. Radford det. VO Sqd. 2, Aircraft Sqds., Battle Fleet to U.S.S. Colorado.

Lt. (jg) Walter F. Boone det. 12th Nav. Dist. San Francisco, to temp. duty Nav. Air Sta., Pensacola.

Lt. (jg) Frederick G. Kahn det. VO Sqd. 2, Aircraft Sqds., Battle Fleet, to U.S.S. Colorado.

Lt. (jg) Lawrence J. Webb det. Nav. Air Sta., Pensacola, to 16th Nav. Dist.

Marine Corps Air Orders

Capt. James T. Moore det. Nav. A. Sta., Pensacola, to Adv. Fly. Sch., Kelly Field.

Hawley C. Waterman appointed lieutenant, assigned to Lakehurst.

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Publisher's News Letter

Several times in the past, attention has been called to the dangers of exaggerated publicity in connection with aviation. When, however, instead of giving to the public a true statement of aerial progress, the presentation of facts is left to the imagination and fanciful distortions of the average newspaper headline writer, it becomes not only harmful but dangerous to the sound progress of air development. To take a case which does not fit all the specifications mentioned above; but just as dangerous, is the newspaper story that has been printed all over the country of the costs of the new Ford Air Line. The impression that has been created is that air express can be carried at a rate of 8½ cents a pound. That figure has been firmly fixed in the public's mind by headlines. No mention was made of the mileage element, so, when the New York-Chicago Line offers to carry packages at, say, $2 a pound, the public will immediately think: "Why, Ford can carry his bulk freight at 8½ cents a pound. Why are we asked to pay twenty-four times as much?" This method of reasoning is perfectly understandable and is an example of the damaging effect of uncontrolled announcements.

* * * *

To everyone who knows anything about the rudiments of transportation, the basic cost figure is, of course, the pound or ton mile. When figured on this basis a different picture is shown. The Ford line is about 300 mi. long while the New York-Chicago Line is about three times that distance. If that were the only new factor to be taken into consideration, it would not be so unfortunate, but the above announcement was accompanied by a statement by Mr. Ford that a very careful analysis of costs is being made, and the public is led to assume that this 8½ cents is the result of this cost estimate. As we happen to know that the figure was unauthorized and incorrect we must assume that the two statements bore no relation to each other except that they were published together. The 8½ cents a pound figure gives $170 a ton trip. As the Stout plane has carried about a half a ton a trip we get a cost of $85 a trip of 300 mi. or about 57 cents a ton mile. As everyone who has studied the fundamental costs of air transport knows, the lowest figures that can be considered conservative range about a dollar a ton mile. And we predict that when the Ford figures are officially announced they will be found to be close to this estimate.

* * * *

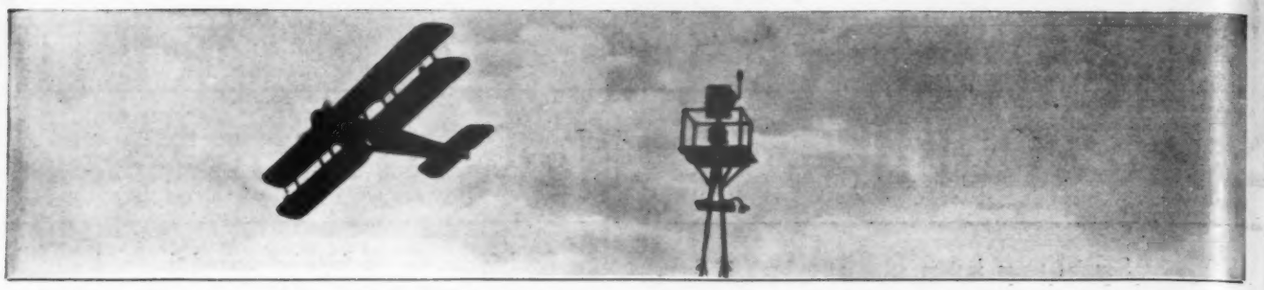
Since writing the above we have seen two new figures of costs. One gives the cost at 12¼ cents a pound and the other somewhat over thirteen cents. At 15 cents a pound the ton mile rate would be exactly $1. a ton mile. In establishing this figure it should be remembered that the Stout planes are carrying 1000 lb. pay load but with better intermediate landing fields and facilities they could dispense with an extra man and several hundred extra pounds of gasoline. If 1500 lb. were carried the costs would be correspondingly lower.

* * * *

Then, the public will not take into consideration that the Ford Line has no problem of securing traffic by advertising and solicitation, no individual collection or distribution charges. If these items that go to make up a proper statement of costs are included, then and then only will the public get any correct idea of what the transport, by air, and delivery of packages costs. Both the Ford Air Line and the Air Transport Co. had their start in Detroit and as it was understood until denied, that the Fords were to be interested in both lines, the way the costs are made public will be watched with more than ordinary interest. The danger of this sort of publicity, especially when attached to the magic name of Ford has a peril for air transport that should be immediately corrected by accurate public announcements.

* * * *

The other danger and perhaps the one that should be considered as more serious is the stock selling that has invariably followed any flamboyant announcements by the newspapers. People who may, or may not, be serious in their intentions immediately take new courage when the public mind is receptive and start a stock selling campaign based, usually, on the prospective performances of untried aircraft which on paper have greater money making possibilities than existing planes. The basis of profits often overlook important items of costs that are well known to those who have studied air transport in the light of experience. There are very great dangers ahead of the aircraft transport problem unless the publicity given to the initial trips is carefully considered, accurate and authoritative.—L.D.G.



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INDEX TO ADVERTISERS

A

Accles & Pollock, Ltd. 709
Advance Aircraft Co. 709
Aircraft Development Co. 708
Aircraft Service Directory 705 - 706
Aircraft Supply Co. 706
Anderson Aircraft Manufacturing Co. 705

B

Barber & Baldwin, Inc. 687

C

Classified Advertising 706
Curtiss Aeroplane & Motor Co., Inc. 688

D

Decatur Aircraft Co. 705

G

Goodrich Rubber Co., B. F. 686
Goodyear Tire & Rubber Co. 704

H

Hamilton Aero Mfg. Co. 705
Haskelite Manufacturing Co. 706

I

Ireland, G. S. 705

J

Johnson Airplane & Supply Co. 708
Johnson Motor Products Co. 705

K

Kantner, H. 706

L

Lamblin, Etablissements 708
Lincoln Standard Aircraft Corpn. 705
Logan Aviation Co., Floyd J. 709
Ludington Exhibition Co., Inc. 705

M

Martin, Glenn L., Co., The 707
Monumental Aircraft Co. 705
Morehouse, H. E. 705

N

Northrop, Marvin A. 709

O

Ostergaard Aircraft Works 705

P

Pander & Zonen, H. 710
Partridge, Inc. 705
Perry-Austen Manufacturing Co. 708
Phenix Aircraft Products Co. 706
Pioneer Instrument Co. 705

R

Robertson Aircraft Co. 711

S

Shannon & Wert Bros. Aviation Co. 706
Southern Airways, Inc. 706
Summerill Tubing Co. 708

T

Titanine, Inc. 709

W

Wallace Aero Co. 705
Where to Fly 702
Wood Elastic Web Co., J. W. 709
Wright Aeronautical Corp. 712

Y

Yackey Aircraft Co. 705

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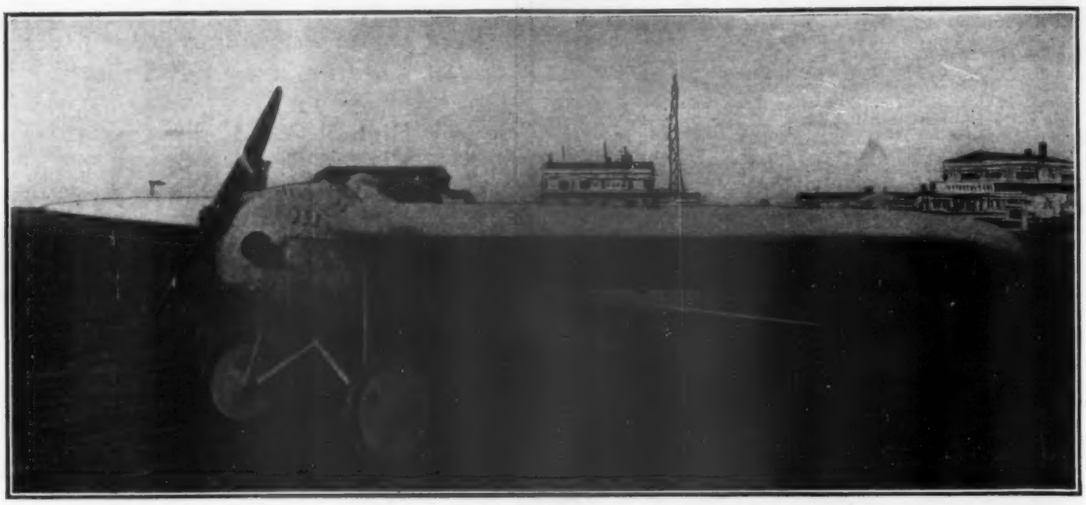

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